WATER RECLAMATION
SOLID WASTE MANAGEMENT

COUNTY SANITATION DISTRICTS
OF LOS ANGELES COUNTY

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Supervisors:

South Bay Cities Main Pumping Plant Incident on January 15, 2006

This report provides the information requested in the motion by Supervisor Knabe, which was approved by the Board of Supervisors on January 17, 2006, regarding the recent sewage spill in the cities of Manhattan Beach and Hermosa Beach, resulting in the temporary closure of several South Bay beaches. The cause of the spill, the corrective actions to be undertaken to prevent recurrence, the status of beach cleanup efforts, and when the beaches were reopened to the public are addressed. Each of these subjects is addressed briefly in this cover letter, and greater detail and technical discussion is provided in the attachment.

The Sanitation Districts operate a network of sewage pumping plants, which handle a total of approximately 18%, or 93 million gallons per day (MGD), of the 515 MGD of wastewater collected and treated by the Districts every day. The South Bay Cities Main Pumping Plant (SBCMPP) receives approximately 2.5 million gallons of wastewater per day from two main trunk sewers serving 30,000 people, primarily in Manhattan Beach and Hermosa Beach, and pumps the wastewater up the hill from The Strand to a gravity sewer which conveys the flow toward the Sanitation Districts' Joint Water Pollution Control Plant in Carson for treatment. The SBCMPP is one of 49 plants that are remotely monitored for operational status using telephone lines for communication at the Central Alarm Center at the Long Beach Main Pumping Plant, which is staffed 24 hours per day. At the time of the spill, the SBCMPP was already in the process of being upgraded with the installation of new telecommunication/monitoring and pump control equipment.

The spill, which began on January 15, 2006 at approximately 10:00 a.m. and lasted until about 1:00 a.m. January 16, 2006, resulted when all three pumps shut down at the pumping plant. It should be noted that the plant had operated for over 20 years, through record rainfall events and power outages, without spilling a drop of wastewater. Approximately 1.5 million gallons of wastewater was spilled from Sanitation Districts and local Hermosa Beach sewers. The majority of the spill volume was contained on the beach using sand berms constructed by the extraordinarily quick action of the County Department of Beaches and Harbors and the City of Hermosa Beach Department of Public Works. Their action, together with the exemplary

cooperation of the Manhattan Beach and Hermosa Beach Police and Fire Departments, the City of El Segundo and numerous elected officials, all combined to minimize the impacts on ocean waters of this emergency situation as Sanitation Districts' personnel worked to restore the pumping plant to an operating condition. The contained wastewater was either returned to the sewer on January 16, 2006 or seeped into the isolated portions of the beach that were used as containment basins. Approximately 5% (70,000 gallons) of the total spill volume did reach the Pacific Ocean.

The cause of the pumping plant failure which led to the spill has been determined to be a failure of both the primary and backup pump control systems, an event which had never before occurred at any of the Sanitation Districts' pumping plants. The Sanitation Districts were unaware of the pump control failure in time to prevent the spill because of an earlier unrelated failure of the telephone circuit used for remote monitoring of the SBCMPP at the Sanitation Districts' Central Alarm Center in Long Beach. The Sanitation Districts have an active and extensive preventive maintenance program to avoid and minimize spills from the sewer system and pumping plants. As a result, over the years, the volume of spills from the Sanitation Districts' system has been one of the lowest in the nation when compared on a per mile of sewer basis. The pump control and telemetry system upgrade already underway at the SBCMPP is part of an ongoing system-wide upgrade program which will increase the reliability of both pump control and remote monitoring at all Sanitation Districts' pumping plants. The new pump control system will have an additional level of redundancy compared to the former system. Meetings have already occurred with telephone service providers and a cooperative approach to improving the reliability of the means of communication has been discussed. As an added measure, to provide a more fail-safe remote monitoring system, top priority will be given to the design and implementation of a redundant telemetry system which does not depend on telephone lines. Until further notice, rotating standby personnel specifically assigned to each pumping plant will respond immediately, 24 hours per day, to any plant experiencing communication failure and stay until remote monitoring is restored. These measures should prevent recurrence of the type of event recently experienced at the SBCMPP.

After the spill on January 16, 2006, beaches were closed by County lifeguards from El Segundo to Palos Verdes Estates. Those limited areas of beach sand impacted by the spill were cleaned up by Sanitation Districts and contract forces. A layer of sand observed to be the most heavily impacted was removed from the site and the remaining areas were disinfected with dry chlorine under the direction of the County Department of Health Services, and the areas were left exposed for a minimum of two days to maximize the disinfecting effect of sunlight. On January 18 and 19, 2006, the affected areas were filled in and covered with berm sand. This restoration technique is an accepted practice and should have restored the beach to its pre-incident condition. In an abundance of caution and to verify the restoration process, the Sanitation Districts took samples of the sand and analyzed to demonstrate the expected absence of bacterial contamination. The results were received Tuesday afternoon, January 31, 2006 and to our surprise showed elevated levels of bacteria. These results were immediately shared with the Department of Health Services, Beaches and Harbors, and the City of Manhattan Beach. The consensus of those discussions was that a very conservative approach should be taken with complete remediation of the sand in the impacted areas as soon as possible. That process is underway and I will report back to you on its progress. In the interim, the limited beach areas in question have been closed to the public. All ocean waters and the remaining beaches remain open and clear of any spill impact.

Receiving waters were sampled daily following the spill for bacterial contamination by the Sanitation Districts and the County Department of Health Services. All beaches were reopened on January 18, 2006 by the County Department of Health Services with the exception of 1000 feet north and south of 21st Street in the City of Manhattan Beach. The small segment on either side of 21st Street was reopened on January 20, 2006.

The Sanitation Districts remain committed to preventing an incident such as this from ever happening again and will use the experience gained from this situation in furtherance of that goal. Although this was a serious and regrettable incident, the Districts' historical record in the operation of its pumping plants and sewerage system has been one of the best in large metropolitan systems nationwide. You have my assurance that every available resource is being applied to this matter and that full and transparent cooperation with regulatory and other interested parties is our approach. I would be happy to make a presentation regarding this matter at any time convenient to your Board. If you have any questions regarding this report, please contact me at (562) 699-7411, extension 1501.

Very truly yours,

James F. Stahl

JFS/PLF/cs

Attachment

cc: Los Angeles County Department of Health Services
Los Angeles County Department of Public Works
Department of Beaches and Harbors
City of Hermosa Beach
City of Manhattan Beach
City of El Segundo
Board Of Directors of South Bay Cities Sanitation Districts
Executive Office of the Board of Supervisors
David Janssen, Chief Administrative Officer, County of Los Angeles

Attachment Containing Additional Details Regarding South Bay Cities Main Pumping Plant Incident on January 15, 2006

Events During the Overflow

The Sanitation Districts operate 49 plants in the combined Joint Districts which are remotely monitored using telephone lines for communication from the Central Alarm Center at the Long Beach Main Pumping Plant, which is staffed 24 hours per day. On January 15, between 5:48 a.m. and 6:13 a.m., the signals from 17 of the pumping plants were sequentially lost. The Sanitation Districts had been experiencing repeated communication failures with this particular group of pumping plants since the end of December 2005 and had been working with both Verizon and AT&T staff to resolve the matter.

Pumping plant operators were dispatched to investigate the condition of each of the 17 pumping plants experiencing communication failure. It should be noted that the loss of telemetry does not in any way signal a failure of the operating equipment at the pumping plant, only that the operating status is unknown. In each of the previous incidents, all pump station electrical and mechanical equipment operated without interruption. In fact, as noted in the cover letter, the South Bay Cities Main Pumping Plant (SBCMPP) has operated for over 20 years, through record rainfalls and power outages, without spilling a drop of wastewater. One of the operators investigated three pumping plants before arriving at the SBCMPP at approximately 10:15 a.m. to find that all three pumps were not operating and that the pumping plant was flooded with wastewater. The operator immediately contacted the Central Alarm Center and additional Sanitation Districts' personnel were dispatched to the site. The operator could not safely enter the pumping plant to investigate the cause of pumping failure due to the flooding in the plant and the presence of live power.

At approximately 10:30 a.m., Sanitation Districts' supervisors arrived onsite to find manholes located along the beach at 30th Street, 21st Street and near the pier in the City of Manhattan Beach overflowing. Additionally, two City of Hermosa Beach sewer manholes located near 35th Street and The Strand and near 21st Street and Hermosa Avenue were observed overflowing. Manhattan Beach and Hermosa Beach Police and Fire Departments blocked public access to all of the overflowing manhole sites. The locations of the overflow manholes and the pumping plant are shown on the attached Figure 1. It was subsequently determined, based on the observations of the initial time of the overflow at certain manholes and residences and knowing the available volume and flowrate in the sewer, that the pumping plant equipment failure occurred at approximately 9:00 a.m. Therefore, if the operator had arrived at the SBCMPP prior to 9:00 a.m., the plant would have been found in a normal operating mode. At approximately 2:30 p.m., a manhole shaft at 21st Street in Manhattan Beach failed, increasing the overflow at this location, and stopping the overflows at all other spill locations. In order to minimize the volume of the overflows during the spill event, the Sanitation Districts dispatched 16 vacuum trucks to draw wastewater from the sewer system at key locations. It was later determined that five houses– two in the City of Manhattan Beach and three in the City of Hermosa Beach – had experienced sewer backups into the structures. Remediation of all of the houses has either been completed or is in the process of being finished in complete cooperation with the owners.

In order to establish normal pumping at the pumping plant, the influent sewers were first plugged to isolate the plant and vacuum trucks were used to dewater the flooded plant, thereby

allowing access to evaluate damage and commence with repair work. Simultaneously, submersible and trailer-mounted pumps and piping were mobilized to bypass flow away from the pumping plant. Sanitation Districts' personnel were able to first restart one of the three permanent pumps at the pumping plant at approximately midnight on January 15. At approximately 12:55 a.m. on January 16, the inflatable plug in the SBC Main Trunk was removed and the overflow stopped. By approximately 3:45 a.m. on January 16, all three of the pumps at the SBCMPP were online and available for operation. The communication signal from SBCMPP to the Central Alarm Center was re-established at 9:36 a.m. on January 16. Repairs to the manhole at 21st St. were completed on January 20, 2006.

Cause of Overflow

Investigation and analysis following the overflow indicate that the cause of the overflow was failure of both the primary pump control system and the backup pump control system at approximately 9:00 a.m. on January 15, 2006. The primary control system monitors the wastewater level in the wet well and operates the pumps to maintain a constant level in the wet well. The primary control system is comprised of a differential-pressure type level transmitter, a programmable logic controller (PLC) and an external level controller. It has been determined that the PLC faulted, preventing its ability to operate the pumps. A backup control system is in place to operate the pumps if the primary control system fails. The backup control system monitors wet well level using an ultrasonic level transmitter. It has been determined that the ultrasonic level transmitter failed to operate properly. Failure mechanisms of both the PLC and of the backup ultrasonic level transmitter have not yet been determined, but investigations continue. Both systems are on a preventive maintenance schedule, and both systems were inspected the first week of January 2006 and were found to be operating properly at that time. The Sanitation Districts have never before experienced a simultaneous failure of both the primary and backup control systems at any pumping plant. It was a rather extraordinary and unfortunate coincidence that the two control systems failed at the same time that the remote monitoring system, which relies on the Verizon and AT&T phone systems, was lost, so that the failure could not be detected until personnel inspected the site.

Containment and Clean Up

Overflows reached the beach at five locations. Most of the overflows were confined to the beach by a combination of natural depressions in the sand and by prompt action of personnel from the County Dept. of Beaches and Harbors and City of Hermosa Beach to construct berms in the sand. In addition, personnel from the Cities of El Segundo and Manhattan Beach used vacuum trucks to stop the overflow at one location. It is estimated that approximately 68,000 gallons reached the ocean at 21st St. in Manhattan Beach and approximately 2,000 gallons at Neptune Ave. in Hermosa Beach.

After the overflows, streets, curbs and gutters at various locations were flushed with water which was recovered and discharged to the sewer. Ponded water and sewage were removed from the beaches by vacuum trucks and a portable trailer-mounted pump. Residual materials were removed from the beach on January 16 and 17, as well as saturated soil where feasible. On January 17, Sanitation Districts' personnel applied dry chlorine to remaining saturated areas under County DHS direction. On January 18 and 19, affected areas were covered with berm sand. As stated in the cover letter, this restoration technique is an accepted practice

and should have restored the beach to its pre-incident condition. In an abundance of caution and to verify the restoration process, the Sanitation Districts took samples of the sand and analyzed to demonstrate the expected absence of bacterial contamination. The results were received Tuesday afternoon, January 31, 2006 and to our surprise showed elevated levels of bacteria. These results were immediately shared with the Department of Health Services, Beaches and Harbors, and the City of Manhattan Beach. The consensus of those discussions was that a very conservative approach should be taken with complete remediation of the sand in the impacted areas as soon as possible. That process is underway and I will report back to you on its progress. In the interim, the limited beach areas in question have been closed to the public. All ocean waters and the remaining beaches remain open and clear of any spill impact.

Impacts to Receiving Waters

In response to the spill, the Sanitation Districts' microbiology laboratory analyzed 113 samples from 31 different surfzone and nearshore locations between January 15 and 23. Based on review of all data, the spill resulted in exceedences of State Single Sample Maximum (SSM) for bacteria at two surfzone sites on January 15, the day of the spill; these occurred in front of the 21st St. spill location and at a site 400m south of 21st St. One other sample exceeded SSMs, at the surfzone site in front of 35th St. on January 17. The SSMs are set to fully protect recreational uses of ocean waters. On both days other sampling sites up and down coast of these locations met water quality standards. All water quality recreational standards were met at 21st St. within approximately 24 hours following the beginning of the spill. At 35th St., water quality standards were exceeded for less than 48 hours. The Department of Health Services issued a formal beach closure notification at about 10:00 p.m. Sunday January 15 for all beaches from Dockweiller at the Hyperion Treatment plant south to Malaga Cove. However, prior to this, on Sunday afternoon, lifeguards had already been posting signs on the beaches from just south of El Segundo to Malaga Cove.

At about 6:00 p.m. on January 18 all beaches except for a section 1000 feet north and south of 21st St. were reopened. At the same time a storm drain outlet posting was placed at 35th St. and 50 yards up and down coast from this site. This posting was removed at 5:18 p.m. on January 19. The remaining closure at 21st St. was removed at about 8:00 a.m. on January 20.

Measures to Prevent Recurrence

At the time of the spill, the Sanitation Districts were in the process of performing combinations of electrical, pump control, and telemetry upgrades at all of their active pumping plants, including the SBCMPP. Because of the SBCMPP incident, the Sanitation Districts have expedited the schedule for performing telemetry upgrades. Telemetry upgrades to the SBCMPP were completed on January 20, 2006.

The telemetry upgrades include replacement of the existing Supervisory Control and Data Acquisition (SCADA) system, which will provide for remote control in addition to monitoring of all of the Sanitation Districts' pumping plants. The new SCADA's primary Human Machine Interface (HMI) station will continue to be located at Long Beach Main Pumping Plant (LBMPP). An additional redundant HMI server will be located at a second 24-hour facility. As an added measure, top priority will be given to the design and implementation of a redundant telemetry system not dependent on telephone lines. Until further notice, rotating standby

personnel specifically assigned to each pumping plant will immediately respond, 24 hours per day, to any pumping plant experiencing communication failure and stay until communication is restored.

The development of the new SCADA system requires removal of the existing electromechanical-relay based controls at all pumping plants and replacement with PLC-based controls. Electrical systems of certain pumping plants will also undergo modifications. In addition, the existing telephone architecture utilizing analog leased-line communication between each pumping plant and LBMPP will be replaced with digital frame relay networks, which transmit data more reliably and allow for quick troubleshooting of the system when problems occur.

The control system at each pumping plant will consist of a PLC and redundantly configured level controllers and backup controls, which constitutes an additional level of redundancy compared to the former system. An uninterruptible power supply (UPS) will be installed to provide backup power for the PLC and the telemetry equipment. The control system will automatically start standby pump(s) when the lead pump experiences any type of failure.

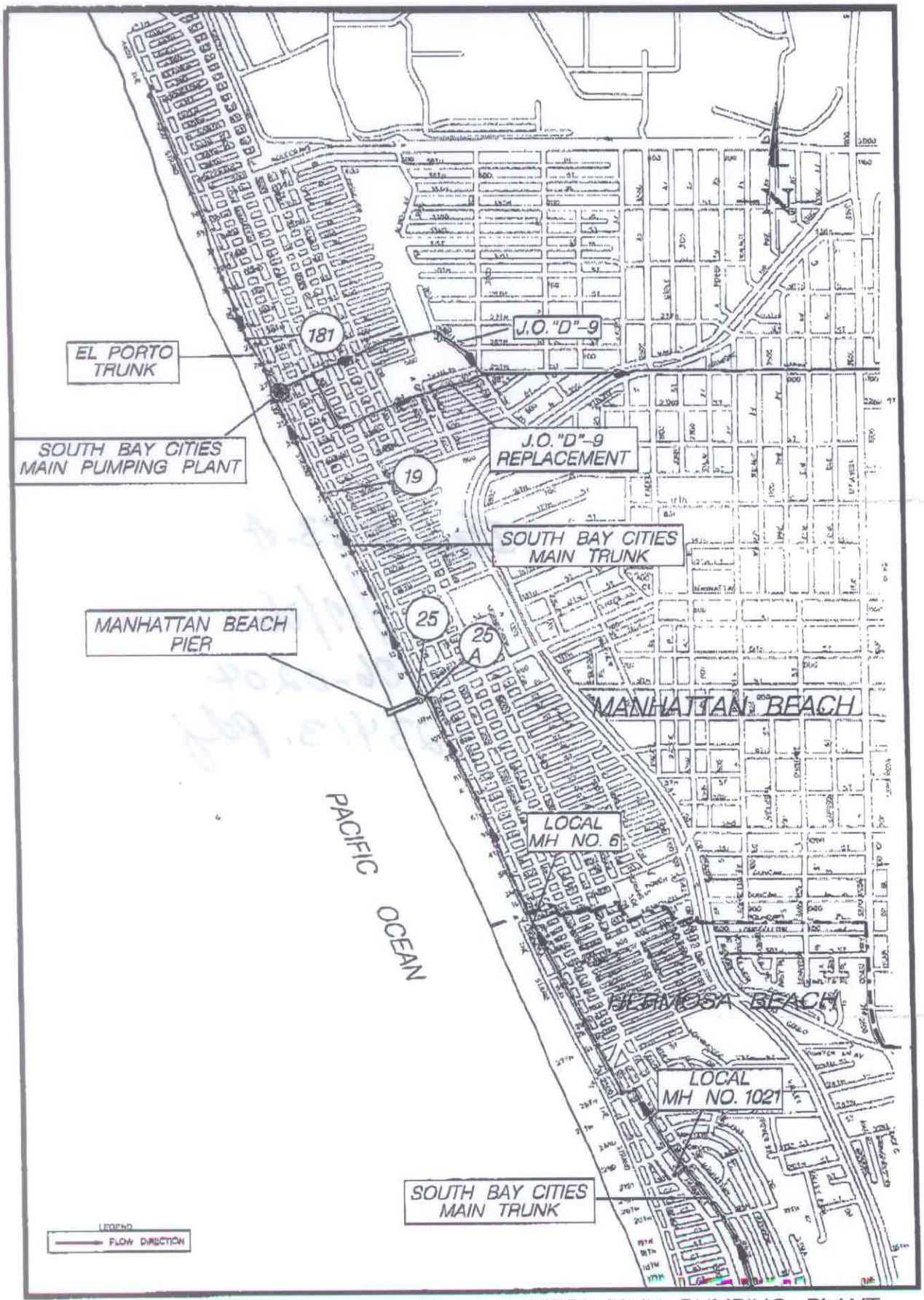

FIGURE 1: OVERVIEW OF SOUTH BAY CITIES MAIN PUMPING PLANT AND INFLUENT SEWERS

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